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A new *Puccinia* on *Thymelaea* from Turkey

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Abstract — The rust fungus *Puccinia salihae* sp. nov. is described from *Thymelaea aucheri* in East Anatolia, Turkey, producing aecia, uredinia, and telia. This is the first report of a rust disease infecting a species of *Thymelaea*.

Key words — phytopathogens, *Pucciniales, Thymelaeaceae, Uredinales*

Introduction

Although many studies on the flora of Turkey have been carried out, the mycobiota is comparatively less studied (Göbelez 1963; Kırbağ 2003, 2004; Hüseyin & Kırbağ 2003; Hüseyin 2004; Bahcecioglu et al. 2009). During surveys of the parasitic fungi on herbaceous plants in the Elazıg province of Turkey a species of *Puccinia* Pers. was observed on *Thymelaea aucheri*, a perennial herb. The disease was observed on host leaves, fruit, and stems. Disease incidence was rare, detected only once during three years' observation. Very few rusts have been recorded from *Thymelaeaceae* and none from *Thymelaea* Mill. (Farr & Rossman 2010).

Materials & methods

The material for this study was collected from the Elazıg-Baskil Province in Turkey in 2007, from square B7 at an altitude of 1800 m. The typical climate of the region is Mediterranean, characterized by hot and dry summers and extremely cold and snowy winters. Field collected specimens were preserved by drying in a plant press according to established herbarium techniques. The host plant was identified using the flora of Turkey (Davis 1985). Holotype material is housed at the Firat University Herbarium (FUH) in Elazig, Turkey; isotype material is housed at the US National Fungus

Collections, Beltsville, MD USA (BPI). DNA extraction, polymerase chain reaction, and cycle sequencing of the nuclear ribosomal large subunit (LSU) were performed as previously described in Aime (2006). A DNA sequence of the LSU has been deposited in GenBank, accession number HQ412645.

Results

A 981 bp sequence of the 5'-end of the LSU was obtained. Blast analyses (Altschul et al. 1997) indicated placement within the *Pucciniaceae*, with closest similarities to other members of *Puccinia*, including *P. windsoriae* (98% similarity), *P. andropogonis* (98%), and *P. emaculata* (97%).

Taxonomy

Puccinia salihae Kirbağ & Aime **sp. nov.** Fig 1

Mycobank MB 519019

Aecia in fructus, folia, caulicola, 1 mm longa, 0.2 mm lata, meliaurantiata, cellulae peridii, sphaeroideae, elipsoideae 20–22.5 × 17.5–20 µm, parietibus 6 µm. Aeciosporae sphaeroideae, ovoidaeae, 20–22 × 18–20 µm, membrana 1–1.5 µm. Uredinia foliacolae, caulicolae, rarius fructicolae, 1–2 mm longa, 0.1–0.5 mm lata, pulvinata, flaventa. Urediniasporae globosae 30–35 × 25–27.5 µm, membrana 1.5 µm crassa, echinulataeae, poris germinationis 4 dispersis. Telia foliicolae, caulicolae, rarius fructicolae 1–2 mm longa, 0.1–0.5 lata, black, fuliginea, pulvinata, pulveraceae. Teliosporae elipticae-ovoideae 45–51 × 30–32 µm, membrane 1–1.5 µm, crassa in apice 4 µm, poro superiore apical, poro inferiore prope septum, crassa caducous stipite, hyaline, 10–25× 5–7.5 µm.

Type: Turkey, elazığ-baskil, Hasan mountain, slope of Hacimustafa village, alt 1800 m on *Thymelaea aucheri* (*Thymelaeaceae*), 14 Jul 2007, leg: S. Kırbağ & M. Kursat (no:2000) (**Holotype** FUH 1272). Isotype in BPI (BPI 881123).

Etymology: Saliha, in honor of the mother of the first author.

Aecia (Fig 1c) on fruits, leaves and stems, 1 mm long, 0.2 mm wide, whitish to honey-orange in color, pinnately arranged. Peridial cells (Fig 1e) honey colored, irregularly shaped, in cross section spherical to ellipsoid, 20–22.5 × 17.5–20 µm, outer wall 1–1.5 µm thick, inner wall 4–5 µm thick. Aeciospores spherical to ovoid, 20–22 × 18–20 µm, spore wall 1–1.5 µm thick. Uredinia on leaves, stems, rarely on fruits, 1–2 mm long, 0.1–0.5 mm wide, yellowish, at first covered by epidermis, later rupturing. Urediniospores globoid 30–35 × 25–27.5 µm, wall 1.5 µm thick, echinulate, germ pores 4, scattered. Telia (Fig 1d) on leaves, stems rarely on fruits, 1–2 mm long, 0.1–05 mm wide, black, powdery. Teliospores (Fig 1f) ellipsoid-ovoid 45–51 × 30–32 µm, spore wall brown-chestnut, 1-1.5 µm thick, apex slightly thickened up to 4 µm, upper pore apical, lower pore near septum, pedicel hyaline, 10–25 × 5–7.5 µm.

Ecology, range & distribution: Known only from *Thymelaea aucheri* at the type location. Worldwide, the host plant has been recorded from Turkey, Syria, Lebanon, and western Iran (Davis 1985).

FIGURE 1. *Puccinia salihae* on *Thymelaea aucheri* (holotype): a–b. infected host plant; c. aecia; d. telia; e. peridial cells; f. teliospores.

Discussion

Thymelaeaceae is represented by three genera (*Diarthron*, *Daphne*, *Thymelaea*) in Turkey (Davis 1985). A single species of rust, *Uredo daphnicola* Dietel, has been reported on *Thymelaeaceae* from Turkey on *Daphne oleoides* Schreb. (Kabaktepe & Bahcecioglu 2005). *Uredo daphnicola* is considered

synonymous with *Melampsora daphnicola* (Dietel) Jørst. (Kuprevich & Transhel' 1957), a fungus that is readily distinguished from *Puccinia salihae* by its colorless urediniospores and paraphysate uredinia.

Worldwide, there are few rusts recorded from *Thymelaeaceae* and none from a species of *Thymelaea* (Farr & Rossman 2010). Only one other species of *Puccinia*, *P. gnidiae* Doidge on *Gnidia microcephala* Meisn. from South Africa, is known to infect a member of the family (Farr & Rossman 2010). In addition to host genus, *P. salihae* differs from *P. gnidiae* primarily by the much larger urediniospores (30–35 × 25–27.5 µm in *P. salihae* vs. 25–30 × 22.5–25 µm in *P. gnidiae*) and teliospores (45–51 × 30–32 µm in *P. salihae* vs. 30–40 × 25–30 µm in *P. gnidiae*) (Doidge 1939).

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